equal to the CHT value minus a first function (F1(RPM, LOAD)) plus a second function (F2(CHT)). The first function is derived from a calibratible look up table showing the deviation of ECT from CHT as a function of revolutions per minute (RPM) and cylinder air charge temperature (LOAD). Both RPM and LOAD values may be derived from the EEC. The second function is to account for the difference between ECT and CHT increases for very high values of CHT.

At step **60**, the engine temperature signal generated and sent to the display **16** (ECT DISPLAY) is set equal to a rolling average function (ROLAV) used to filter out noise. The rolling average function is determined as a function of the temporary ECT value and a calibratible time constant (RUN TC) that takes into consideration the fact that CHT heats faster than the engine coolant.

At step **62**, the temperature difference (DELTA) is determined and stored. The DELTA is the difference between the CHT and the engine temperature signal generated. The DELTA is sent to the display **16** and is stored in KAM, so that the DELTA at power-down is available during the next power-up. At step **64**, the process ends.

If the pass at step **56** was not completed, then the process flow moves to step **66**, where DELTA is determined as a function of the last DELTA stored in KAM multiplied by an exponential decay function (EXP). The EXP is a function of the number of minutes the engine **12** has been powered down (SOAKTIME) divided by a calibratible time constant (SOAK TC), which determines the rate at which DELTA decays during a soak. This information is available from the EEC **44**. The EXP is equal to 1 if SOAKTIME equals zero and decays to zero as SOAKTIME approaches infinity. At step **68**, the engine temperature signal generated and sent to the display **16** is equal to the difference between the CHT and the DELTA from step **66**. At step **70**, INIT FLG is registered as 1 indicating that the initial pass has been completed. At step **64**, the process ends.

The present invention is advantageous for a number of reasons. First, because ECT is calculated as a function of the vehicle operational state "false readings" are avoided. For example, "false readings" which may arise when CHT is running hotter then ECT, but still within an acceptable operational range. Further, filtering the calculated ECT prevents inaccurate display readings resulting from sudden changes in vehicle operational states. More specifically, because ECT is being inferred by CHT as a function of RPM and LOAD, anomalous readings for RPM and LOAD need to be taken out of the calculation as they tend to change faster than actual CHT and ECT. In other words, if ECT is being inferred at a time when there is a sudden spike in RPM, with the RPM then returning to normal running, without filtering, the ECT calculation would indicate being out of control limits when that is not actually the case. It is an important aspect of the invention, therefore, that not only is ECT inferred from CHT as a function of vehicle operational states, but also that the ECT sent to the display is filtered to eliminate noise resulting from the various operational states.

Various other modifications to the present invention will, no doubt, occur to those skilled in the art to which the present invention pertains. It is the following claims, including all equivalents, which define the scope of the present invention.

What is claimed is:

1. A method of inferring engine coolant temperature in cylinder head temperature sensor equipped vehicles comprising the steps of:

measuring the cylinder head temperature;

calculating the engine coolant temperature from the measured cylinder head temperature as a function of at least one vehicle operational state;

generating a signal for the calculated engine coolant temperature; and

sending the generated signal to a display.

2. A method according to claim **1**, wherein the vehicle operational state is engine revolutions per minute.

3. A method according to claim **2**, wherein the vehicle operational state is cylinder air charge temperature.

4. A method according to claim **1**, wherein the vehicle operational states are both engine revolutions per minute and cylinder air charge temperature.

5. A method according to claim **1**, further including the step of filtering the calculated engine coolant temperature so as to prevent inaccurate display readings resulting from sudden changes in vehicle operational states, the filter step performed prior to the step of generating a signal.

6. A method according to claim **5**, further including the step of recording the difference between the measured cylinder head temperature and the filtered engine coolant temperature.

7. A method according to claim **6**, further including the step of storing the recorded difference in keep alive memory.

8. A method according to claim **7**, further including the steps of:

decaying the difference between the measured cylinder head temperature and the filtered engine coolant temperature as an exponential function of soak time upon vehicle startup;

generating an initial, startup signal by subtracting the measured cylinder head temperature from the last recorded difference stored in keep alive memory; and

sending an initial, startup signal to the display.

9. A method of inferring engine coolant temperature in cylinder head temperature sensor equipped vehicles comprising the steps of:

measuring the cylinder head temperature;

calculating the engine coolant temperature from the measured cylinder head temperature as a function of engine revolutions per minute and cylinder air charge temperature;

generating a signal for the calculated engine coolant temperature; and

sending the generated signal to a display.

10. A method according to claim **9**, further including the step of filtering the calculated engine coolant temperature so as to prevent inaccurate display readings resulting from sudden changes in revolutions per minute and air charge temperature, the filtering step performed prior to the step of generating a signal.

11. A method according to claim **10**, further including the step of recording the difference between the measured cylinder head temperature and the filtered engine coolant temperature.

12. A method according to claim **11**, further including the step of storing the recorded difference in keep alive memory.

13. A method according to claim **12**, further including the steps of:

decaying the difference between the measured cylinder head temperature and the filtered engine coolant temperature as an exponential function of soak time upon vehicle startup;

generating an initial, startup signal by subtracting the measured cylinder head temperature from the last recorded difference stored in keep alive memory; and

sending an initial, startup signal to the display.

14. A system for inferring engine coolant temperature in cylinder head temperature sensor equipped vehicles comprising:

a cylinder head temperature sensor; and

a controller for calculating the engine coolant temperature from the measured cylinder head temperature as a function of engine revolutions per minute and cylinder air charge temperature, wherein the controller generates a signal for the calculated engine coolant temperature and sends the generated signal to a display.

15. A system according to claim **14,** wherein the controller further filters the calculated engine coolant temperature so as to prevent inaccurate display readings resulting from sudden changes in revolutions per minute and air charge temperature, the filtering performed prior to generation of the signal.

16. A system according to claim **15,** wherein the controller further records the difference between the measured cylinder head temperature and the filtered engine coolant temperature.

17. A system according to claim **16,** wherein the controller further stores the recorded difference in keep alive memory.

18. A system according to claim **17,** wherein the controller further:

decays the difference between the measured cylinder head temperature and the filtered engine coolant temperature as an exponential function of soak time if determined that the cylinder head temperature measurement was taken at vehicle startup;

generates an initial, startup signal by subtracting the measured cylinder head temperature from the last recorded difference stored in keep alive memory; and

sends an initial, startup signal to the display.

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